

Torque, Linear and Custom Motors

Stepper, Servo and Traction Motors

Drive Electronics and Controllers

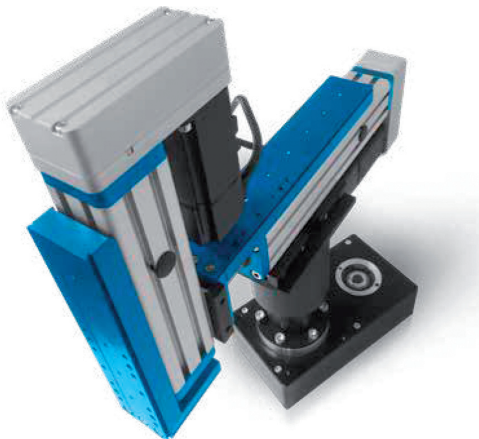
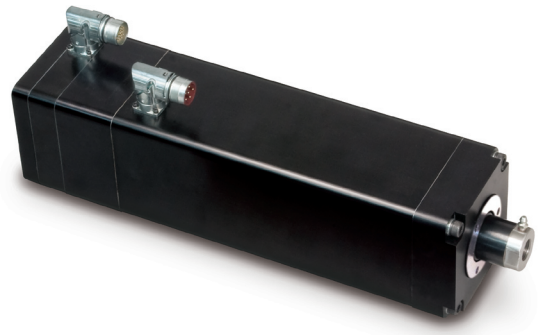
Actuators and Sensors

CAE Tools and Engineering

Motion Control Systems

Actuators & Automation

Rotary & Linear Drives



MACCON – ACTUATORS & AUTOMATION

ROTARY & LINEAR DRIVES

Technologies

Servo- and Stepper Motors

Our actuators and automation stages are driven either by servo- or stepper motors. Servos offer the advantages of higher speeds, higher torque levels, a high ratio of peak to continuous rating and precise control. Steppers are especially cost-effective, robust and need no feedback for position control.

Position Feedback

With the exception of open-loop stepper-motor driven stages, we provide integrated encoders or resolvers as position feedback devices for optimum control. The screw and gearbox driven systems can be fitted with multi-turn encoders to allow absolute position monitoring. Additional switches provide feedback of reference positions or motion limits.

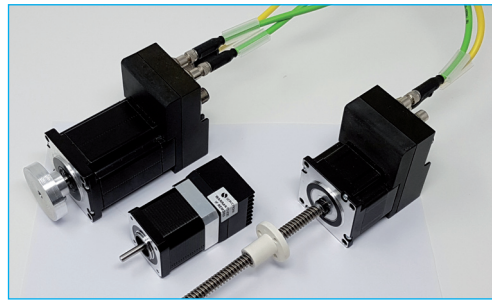
3 Phase Compatibility

The servomotors, integrated in our actuators and automation stages, are 3-phase brushless. This makes their use very flexible as they can be controlled by almost any family of 3-phase motor controllers. For EMAs and motion stages MACCON most commonly supplies controllers from Copley Controls and Kollmorgen.

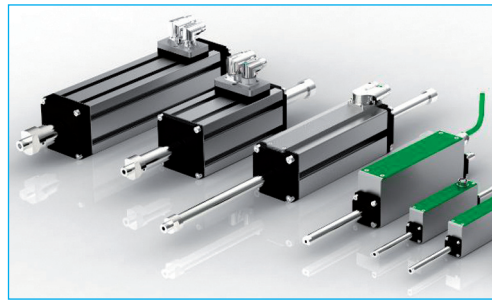
For more details about our technology see www.maccon.de/en/news/wiki.html.

EMAs

EMA stands for Electro-Mechanical Actuator, otherwise known as the Electric Cylinder or Electric Rod Actuator. EMAs are high-force linear or high-torque rotary actuators, with a limited movement range (typically up to 2 m or 360°), which offer both dynamic and high precision positioning capability. They need only a single energy source – electrical; there is no risk of air or oil leakage! They also have other major advantages compared to pneumatic and hydraulic cylinders.



Cost effective EMAs, stepper motor driven (Haydon Kerk)



Direct-drive tubular motors (NiLAB)

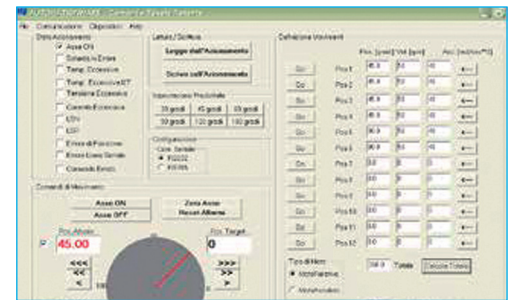
Motion Control Systems for Automation

In addition to EMAs we provide linear and rotary stages, both direct drive and with mechanical reduction, which are pre-configured for the implementation of motion axes within an automation system.



Xenus Plus motor controller (Copley Controls)

These require a minimum of mechanical adaptation and complementation in order to realize an industrial multi-axis manufacturing, processing or transportation system.



Controller GUI (Automationware)

Drives & Controllers

Our motor drives and controllers are highly flexible; they bring together an intuitive software programming environment and best-in-class motion performance to help you build a powerful machine or process line, single or multi-axis. PLC functionality, the industry-standard IEC 61131-3 PLC programming toolkit, is also available, as well as safety features such as STO “Safe Torque Off”.



AKD universal servocontroller (Kollmorgen)

Our drives and controllers are available with operating voltages from 12 to 650 V and peak phase currents up to 200 Arms.



Multi-axis
Motion Control

MACCON – ACTUATORS & AUTOMATION

ELECTRO-MECHANICAL ACTUATORS

High-force linear and rotary Actuation

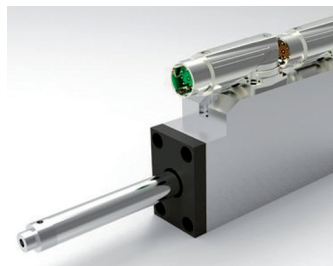
Lead-screw, recirculating-ball or planetary-roller screws

Our linear EMAs make use of the advantages of three different types of mechanical reduction. Our smaller EMAs mostly employ lead-screws, which have a low mechanical efficiency but the advantage of high reverse damping or self-locking. In the mid-force range recirculating-ball screws offer both high efficiency and speed. For high force levels planetary-rollers are employed. We also offer multiple options for our lead-screws and nuts featuring self-lubricating polymers. For maximum performance, low friction, smooth operation and durability in all types of environments Kerkote®, Kerkite® and Black Ice® TFE coatings provide unmatched results. Our rotary actuators are either direct drive or fitted with planetary or harmonic gearboxes.

Pneumatics and Hydraulics

The main reason engineers select an electro-mechanical actuator over a pneumatic or hydraulic cylinder system is the flexibility of its motion control capabilities; EMAs, coupled with a servo drive and motor system, have infinite control over position with accuracy and repeatability levels far beyond the capabilities of a pneumatic or hydraulic system.

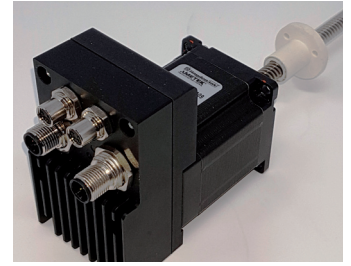
In the field of actuators MACCON offers a wide range of electromechanical systems, as well as direct-drive actuators. The most important categories are:



Miniature direct drive actuator (NiLAB)



Rotary stage (Nikki Denso)



EMA with closed-loop stepper drive (HaydonKerk)

EMAs based on lead-screw technology

- Peak forces from 25 up to 2,500 N
- Self-locking or damping (often no holding brake needed)
- PM-Hybrid and claw-pole stepper motors
- Closed-loop stepper versions for maximum force and full control
- Vacuum compatible solutions available



EMAs for hygienic environments (Tolomatic)

EMAs based on ball-screw technology

- Peak forces up to 120 kN
- External servo/stepper motor inline or parallel

EMAs based on inverted roller-screws (integrated motor)

- Peak force up to 60 kN
- Servomotor drives screw nut concentrically leading to the highest force density.

EMAs based on roller-screws (external motor)

- Peak forces up to 178 kN
- External servo/stepper motor inline or parallel

Rotary EMAs – Gear motors (harmonic drive)

- Rated/peak torque up to 557/800 Nm
- Hollow shaft: 9 - 45 mm

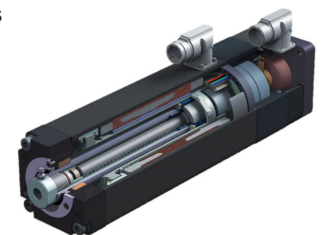
EMAs as stainless steel / hygienic / wash-down configuration

- IP67 / IP69K options
- Food authority approvals
- Integrated or external motor

Accessories

We can provide EMAs with a large number of accessories, e.g.

- Custom nuts
- T-slot mounting grooves
- Mounting plates
- Clevis mounts
- Brakes
- Limit switches
- Cables



Cross-section of high-force EMA (Tolomatic)

Our Partners for EMAs



MACCON – ACTUATORS & AUTOMATION

INDUSTRIAL AUTOMATION

Motion Control Systems, single and multi-axis

We offer high precision motion systems at any level of sophistication and integration, providing all necessary mechanical, electrical and software supply and support. Single- and multiple-axis systems are our expertise, either employing standard components from key suppliers or custom designed products.

Linear stages (ballscrew)

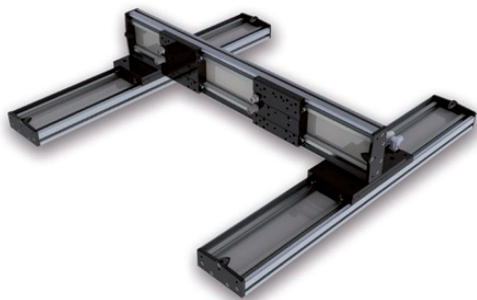
- Peak forces to 30 kN
- Stroke up to 3 m



2D Robot (NiLAB)

Linear stages (belt drive)

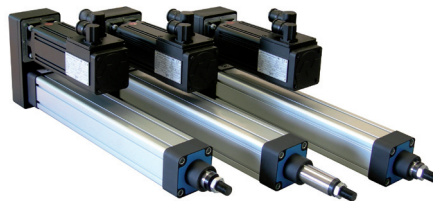
- Peak forces to 7,6 kN
- Stroke up to 5,8 m



Linear Stage Gantry (Sinadrives)

Linear stages (direct drive)

- Linear motors with linear bearings with peak forces up to 4,000 N
- Stroke up to 2.5 m
- Tubular stages with peak forces up to 1,500 N
- Maximum speeds up to 5 m/sec.



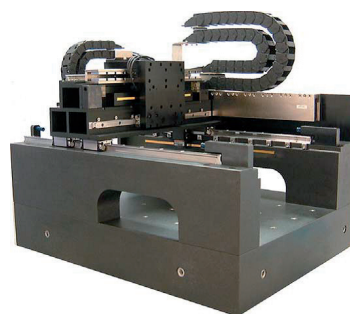
Belt linear drives (Automationware)

Rotary tables (belt drive)

- Peak torque up to 70 Nm
- Large hollow shaft up to 110 mm

Rotary tables (direct drive)

- Peak torque up to 1,000 Nm
- Hollow shaft up to 68 mm
- Integrated angle encoder with up to 26 bit resolution



XY Precision stage (Akribis)

Direct Drive vs. mechanical Reduction

Direct drive offers the best dynamic, repeatable and precise motion. No gear-box or linear screw reduction is employed; which is always a source of backlash (hysteresis) and resonance (due to limited torque stiffness of the torque transmission train). Direct drive has the advantage of being more accurate, more dynamic (higher bandwidth) and smoother at low speed (at the edge of stick-slip friction).

Clean room, vacuum compatibility

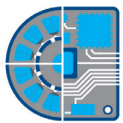
For semiconductor manufacturing and other sensitive manufacturing and test applications cleanliness is essential. Often our stages must operate in vacuum and at elevated temperatures. MACCON can provide linear and rotary stages to meet these environmental requirements.

MACCON – ACTUATORS & AUTOMATION

APPLICATION EXAMPLES

In all fields of Engineering and Industry

On the right we list and illustrate some application fields and examples. For any mechanical or engineering system requiring controlled motion – be it linear, rotary, single or multi-axis – MACCON has a solution to offer. Performance depends on all components – motor/ actuator/ stage, drive, controller, software, power supply, inter-connection and support tools. Each of these components is designed and optimized to achieve one goal: enhancing the performance in your machine. The complete system is tested to ensure an uncompromised level of motion performance. This is the special service that MACCON offers to customers (MOTIONEERING = Motion Control components + Engineering).



Motioneering
Turn-key Systems

Motors made to measure

Just as for motors MACCON is able to provide customized modifications to our EMAs and Actuation system. These typically involve mechanical, cable and connector, supply voltage modifications. We are also able to program and commission the controllers to perform dedicated, custom-specified functions and operating sequences.



Motors
made to measure!

Industrial Automation:

- Material handling – storage, conveyor, AGV
- Metalworking – EDM, water-jet, laser, wire-feed welding
- Food and Beverage – filling, valve control, fast food automation
- Inspection, Vision and Test – CMM
- Packaging – wrapping and strapping, web guide, slitter, palletizing
- Textile – loom, shuttle, cutting systems, shear, embroidery
- Woodworking – panel saw, router, gauge
- Pump – metering, down-hole
- Welding grips and injection molding, presses



Medical Equipment:

- Dental and surgical tools
- Endoscopy
- Robotic surgery
- Medical imaging (CT, PET, MRI, X-Ray)
- Pumps for dialysis, infusion, syringe and peristaltic
- Pharmaceutical dispensing
- Respiratory care – CPAP, respirators and ventilators



Laboratory Instrumentation:

- Chromatography – gas & liquid
- Mass spectrometry
- Immunoassay automation
- Centrifuge and auto-transfusion
- Electronic pipetting



Semiconductor:

- Wire bonder
- Wafer handling
- Automated assembly and loading stations
- Slicing and coating
- Inspection and test



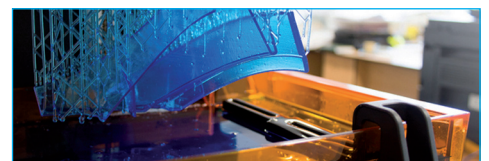
Transportation:

- Flight control systems
- Agricultural automation
- Engine control systems
- Automated door controls
- Active suspension systems
- Seating and window shade adjustment



Business Machines:

- Commercial printers, document handling and binding
- Data Storage – robotic storage and copying, tape and disk drive
- Monetary Automation – ATM, check processing, ID card printing
- Mobile Communications – cellular and satellite antennas, TV broadcast
- Vending



Security & Defense:

- Light, camera and projector pointing
- Air cargo security
- Border & port security screening
- People and building entrance screening
- Cargo & vehicle inspection

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Motion Control Systems	www.maccon.de

Company Portrait

MACCON is a leading supplier of electric motors, EM-actuators, drive and control electronics in the range of 1 W to 250 kW. The company was founded in 1982.

MACCON provides drive solutions to meet demanding system requirements. We co-operate with many reputable product manufacturers, combining their high-quality products with our own custom-developed designs, to create high-performance yet cost-effective drive systems.

Our mission is to serve users in solving their real-time motion control problems in machines, processes and experiments. We ensure that the target machine exhibits:

- Precise, dynamic and smooth motion
- Compatibility with electrical and mechanical interfaces as well as with the host control
- Perfect adaptation to the physical environment

We are committed to providing our customers with top quality products and performance along with expert technical support. We strive to be the technical leader in motion control systems.

Firmenportrait

MACCON ist ein technisch führender Anbieter von Elektromotoren, EM-Aktuatoren, Antriebs- und Steuerelektronik in der Leistungsklasse 1 W bis 250 kW. Das Unternehmen wurde 1982 gegründet. MACCON löst anspruchsvolle Antriebsaufgaben, die hohe, technischen Anforderungen stellen. Wir arbeiten mit vielen renommierten Partnerunternehmen zusammen, deren hochwertige Produkte, kombiniert mit unseren eigenen Entwicklungen, die Realisierung leistungsfähiger und zugleich wirtschaftlicher Antriebssysteme ermöglichen.

Es ist unsere Aufgabe, Anwender bei der Lösung ihrer Echtzeitbewegungsprobleme in Maschinen, Anlagen und Experimenten zu unterstützen. Wir stellen in der Zielmaschine sicher:

- Eine genaue, dynamische und gleichläufige Bewegung
- Die Anpassung unserer Produkte an die Hoststeuerung sowie an die mechanischen und elektrischen Schnittstellen
- Eine perfekte Anpassung an die physikalische Umgebung

Wir sind dem Grundsatz verpflichtet, unseren Kunden sowohl eine erstklassige Produktqualität und -performance als auch eine gute technische Beratung zu liefern. Wir streben die fachliche Führung im Bereich der elektronischen Antriebstechnik an.

